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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Jackwang Choi

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HARNESS, DICKEY & PIERCE, P.L.C.

P.O. BOX 8910

RESTON, VA 20195

EXAMINER

GOUDREAU, GEORGE A

ART UNIT

PAPER NUMBER

1763

DATE MAILED: 10/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/807,139

Applicant(s)

CHOI ET AL.

Examiner

George A. Goudreau

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) 12-14, 18-28 and 32-38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 15-17 and 29-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

G. Goudreau
GEORGE GOUDREAU
PRIMARY EXAMINER

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

1. Claims 15-17, and 29-31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

-In claim 3, the term "ethylene oxide-propylene oxide tri-block polymers" should read "ethylene oxide-propylene oxide-ethylene oxide tri-block polymers" in order to be a tri-block polymer.; and

-Claims 15-17, and 29-31 are composition claims which incorrectly depend upon method claims. (i.e.-The examiner cannot tell what applicant is trying to claim. Dependent composition claims should depend upon independent composition claims in order to eliminate any confusion.)

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 1 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Lee et. al. (2002').

Lee et. al. disclose a cmp slurry, which is used to selectively cmp polish an oxide layer to a polysi layer which is comprised of SS-25 slurry from Cabot Co. The SS-25 cmp slurry is comprised of a 25 wt. % silica based slurry which is diluted D.I. water, stabilized with KOH, and adjusted to a pH of 11.0). This cmp slurry additionally contains a non-ionic surfactant, which is used to enhance the selectivity of the polishing of the oxide layer relative to the polysi layer. For example, a EO-PO-EO triblock

copolymer (i.e.-ethylene oxide-propylene oxide-ethylene oxide triblock copolymer) such as Pluronic-L64 may be used as a surfactant. The surfactants, which are disclosed in this reference, protect the surface of the polysi layer during cmp polishing (i.e.-passivate the surface of the polysi layer) by being adsorbed to the surface of the polysi layer. This is discussed specifically on page 477; and discussed in general on pages 477-481. This is shown in figures 1-7.

As to applicant's recitation of a specific cmp polishing process in their cmp composition claims, it is irrelevant that the reference taught above does not specifically teach the conduction of applicant's claimed cmp process since the cmp slurry is inherently capable of performing applicant's claimed cmp process. The examiner cites the case law listed below of interest to the applicant in this regard.

Furthermore, it is obvious to one skilled in the art that the configuration of the substrate worked upon by the apparatus claimed in this invention is not patentable in view of In re Young (25 U.S.P.Q. 69, 71 (CCPA 1935)) and In re Rishoi (94 U.S.P.Q. 71,73 (CCPA 1952)). The Court of Customs and Patent Appeals stated in In re Young that inclusion of material worked upon by a machine as element in claim may not lend patentability since claim is not otherwise allowable. Similarly, the Court of Customs and Patent Appeals stated in In re Rishoi that there is no patentable combination between a device and the material upon which it works.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 3-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the reference as applied in paragraph 3 above.

The reference as applied in paragraph 3 above fail to specifically disclose the following aspects of applicant's claimed invention:

- the specific cmp polishing parameters, which are claimed by the applicant;
- the usage of the specific non-ionic surfactants in the cmp slurry which are claimed by the applicant; and
- the specific usage of the types of PH controllers in the cmp slurry, which are claimed by the applicant to adjust the PH of the cmp slurry

It would have been obvious to one skilled in the art to employ any of the specific non-ionic type surfactants, which are claimed by the applicant in the cmp slurry, which is taught above based upon the following. The reference generically teaches the usage of non-ionic surfactants to improve the selectivity of the cmp polishing of an oxide layer to a polysi layer. Further, the usage of the specific surfactants, which are claimed by the

applicant, is conventional or at least well known in the surfactant art. (The examiner takes official notice in this regard.) Further, this would simply provide an alternative, and at least equivalent means for providing a non-ionic surfactant in the cmp slurry, which is taught above to the specific means, which are taught above.

It would have been obvious to one skilled in the art to employ any of the pH adjusting agents (i.e.-pH controllers) which are specifically claimed by the applicant to adjust the pH of the cmp slurry taught above based upon the following. The usage of the particular pH adjusting agents, which are claimed by the applicant, is conventional or at least well known in the cmp polishing arts. (The examiner takes official notice in this regard.) Further, this would simply provide a means for desirably adjusting the cmp slurry pH to a desired operating range.

It would have been prima facie obvious to one skilled in the art to employ any of a variety of different process parameters in the cmp polishing process which is taught above, including those which are specifically claimed by the applicant. These are all well-known variables in the cmp polishing art, which are known to effect both the rate and the quality of the cmp polishing process. Further, the selection of particular values for these variables would not necessitate any undo experimentation, which would have been indicative of unexpected results.

Alternatively, it would have been obvious to one skilled in the art to employ the specific cmp process parameters which are claimed by the applicant in the cmp polishing process which is taught above based upon In re Aller as cited below.

Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. ≡ In re Aller, 220 F. 2d 454, 105 USPQ 233, 235 (CCPA).

Further, all of the specific process parameters which are claimed by the applicant are results effective variables whose values are known to effect both the rate, and the quality of the cmp polishing process.

7. Claims 1-11, 15-17, and 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et. al. (JP 10-102,040).

Yoshida et. al. disclose a process for cmp polishing a SiO₂ layer on the surface of a wafer using a cmp slurry with a pH=(7-10) which is comprised of the following components:

- ceria abrasive particules,
- H₂O, and
- at least one of a non-ionic surfactant, a water soluble amine surfactant, etc.

This is discussed specifically in the abstract, and discussed in general on pages 1-4. Yoshida et. al. fail, however, to specifically disclose the following aspects of applicant's claimed invention :

- the specific cmp polishing parameters, which are claimed by the applicant;
- the usage of the specific non-ionic surfactants in the cmp slurry which are claimed by the applicant; and
- the specific usage of the types of PH controllers in the cmp slurry, which are claimed by the applicant to adjust the PH of the cmp slurry

It would have been obvious to one skilled in the art to employ any of the specific non-ionic type surfactants, which are claimed by the applicant in the cmp slurry, which is taught above based upon the following. The reference generically teaches the usage of non-ionic. Further, the usage of the specific surfactants, which are claimed by the applicant, is conventional or at least well known in the surfactant art. (The examiner takes official notice in this regard.) Further, this would simply provide an alternative, and at least equivalent means for providing a non-ionic surfactant in the cmp slurry, which is taught above to the specific means, which are taught above.

It would have been obvious to one skilled in the art to employ a combination of the non-ionic surfactant with the water soluble amine surfactant in the cmp polishing process taught above based upon the following. The reference teaches the equivalence in using either type of surfactant in the cmp slurry employed in the process taught above. Thus, it would have been obvious to one skilled in the art to employ a cmp slurry, which is comprised of both types of surfactants.

It would have been obvious to one skilled in the art to employ any of the pH adjusting agents (i.e.-pH controllers) which are specifically claimed by the applicant to adjust the pH of the cmp slurry taught above based upon the following. The usage of the particular pH-adjusting agents, which are claimed by the applicant, is conventional or at least well known in the cmp polishing arts. (The examiner takes official notice in this regard.) Further, this would simply provide a means for desirably adjusting the cmp slurry pH to a desired operating range.

It would have been prima facie obvious to one skilled in the art to employ any of a variety of different process parameters in the cmp polishing process which is taught above, including those which are specifically claimed by the applicant. These are all well known variables in the cmp polishing art, which are known to effect both the rate and the quality of the cmp polishing process. Further, the selection of particular values for these variables would not necessitate any undue experimentation, which would have been indicative of unexpected results.

Alternatively, it would have been obvious to one skilled in the art to employ the specific cmp process parameters which are claimed by the applicant in the cmp polishing process which is taught above based upon *In re Aller* as cited below.

Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. ≡ In re Aller, 220 F. 2d 454, 105 USPQ 233, 235 (CCPA).

Further, all of the specific process parameters which are claimed by the applicant are results effective variables whose values are known to effect both the rate, and the quality of the cmp polishing process.

It would have been inherent that the cmp slurry employed in the process taught above has the polishing selectivity, which is claimed by the applicant since the same chemistry is employed in the slurry taught above as that, which is claimed by the applicant. The examiner cites the case law listed below of interest to the applicant in this regard.


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In re Swinehart (169 U.S.P.Q. 226 (CCPA)) and In re Best (195 U.S.P.Q. 430 (CCPA)) state that when an examiner has reasonable basis for believing that functional characteristics asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be inherent characteristics of the prior art, the examiner possesses the authority to require an applicant to prove that the subject matter shown to be in the prior art does not possess the characteristics relied upon.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

9. Any inquiry concerning this communication should be directed to examiner

George A. Goudreau at telephone number (571)-272-1434.


George A. Goudreau
Primary Examiner
Art Unit 1763